

L1630105235 – St. Clair Co.  
Amoco Oil Company  
ILD#000670703  
SF/HRS

# CERCLA

## Expanded Site Inspection

946796



Illinois Environmental  
Protection Agency

## **TABLE OF CONTENTS**

<b>Section</b>	<b>Page</b>
<b>1.0 INTRODUCTION.</b> . . . . .	1
<b>2.0 SITE BACKGROUND</b> . . . . .	3
2.1 Site Description . . . . .	3
2.2 Site History . . . . .	4
2.3 Previous Investigations. . . . .	5
2.4 Regulatory Status. . . . .	5
<b>3.0 EXPANDED SITE INSPECTION ACTIVITIES.</b> . . . . .	7
3.1 Sampling Activities. . . . .	7
3.1.1 Soil Sampling. . . . .	7
3.1.2 Residential Well Sampling. . . . .	8
3.2 Analytical Results . . . . .	9
<b>4.0 IDENTIFICATION OF SOURCES</b> . . . . .	10
4.1 Contaminated Soil. . . . .	10
<b>5.0 MIGRATION PATHWAYS.</b> . . . . .	12
5.1 Groundwater. . . . .	12
5.2 Surface Water. . . . .	13
5.3 Soil Exposure. . . . .	13
5.4 Air Route. . . . .	14
<b>6.0 ADDITIONAL RISK BASED OBJECTIVES.</b> . . . . .	16
<b>7.0 REFERENCES.</b> . . . . .	17

## ***FIGURES***

FIGURE 1 STATE MAP  
FIGURE 2 SITE AREA MAP  
FIGURE 3 SAMPLE LOCATIONS

## ***TABLES***

TABLE 1 SAMPLE DESCRIPTIONS  
TABLE 2 SOIL SAMPLE SUMMARY  
TABLE 3 KEY SOIL SAMPLE SUMMARY  
TABLE 4 GROUNDWATER SAMPLE  
TABLE 5 KEY GROUNDWATER SAMPLE SUMMARY

## ***APPENDICES***

VOLUME I - RA REPORT

- A 4-MILE RADIUS MAP
- B TARGET COMPOUND LIST
- C ESI PHOTOGRAPHS

VOLUME II - ESI ANALYTICAL RESULTS

- D TARGET COMPOUND LIST ANALYTICAL RESULTS

## **1.0 INTRODUCTION**

The Illinois Environmental Protection Agency's (IEPA) Office of Site Evaluation (OSE) was tasked by Region V of the United States Environmental Protection Agency (U.S. EPA) Region V to conduct an Expanded Site Inspection (ESI) of the Amoco Oil Company site (ILD#000670703) in Belleville, Illinois. This ESI was conducted under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) commonly known as Superfund.

The Amoco Oil Company site was initially placed on the Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) on May 1, 1980. The site has been the subject of at least two CERCLA investigations prior to the 2001 ESI. In 1986 an IEPA lead Preliminary Assessment was conducted, and in 1988 a Screening Site Inspection was conducted by Ecology & Environment. A recommendation was made after the 1988 SSI that the site move along for further CERCLA investigation due to the results of soil samples collected during that investigation.

The objective of an ESI is to collect all the data necessary to prepare a Hazard Ranking System (HRS) scoring package to propose the site to the National Priorities List (NPL). To fully evaluate the site and fulfill HRS documentation requirements, the ESI should:

- 1) Investigate and document critical hypotheses or assumptions not completely tested during previous investigations
- 2) Collect samples to attribute hazardous substances to site operations
- 3) Collect samples to establish representative background levels
- 4) Collect any other missing HRS data for pathways of concern



U.S. EPA Region V offices have requested that the IEPA identify sites during the ESI process that may require a Removal Action to remediate an immediate threat to human health and/or the environment. A formal request from the IEPA for Removal Action for the Amoco Oil site was never made. The IEPA evaluated a number of Removal Action Criteria during the 2001 ESI. These criteria may include the presence of one or more of the following: contaminated drinking water supplies, hazardous substances stored in containers that may pose a threat of release, high level contamination at or near the surface in soils that may migrate, and a threat of fire or explosion. It was determined based upon the aforementioned criteria that the Amoco Oil site did not pose an immediate threat to human health and/or the environment. Therefore a determination was made that a CERCLA Removal Action was not warranted.

## **2.0 SITE BACKGROUND**

### **2.1 Site Description**

The address given on CERCLIS for the Amoco Oil Company site is Route 2, Belleville, Illinois. The site is located approximately 3.5 miles northeast of Belleville in rural St. Clair County. The site is located on the north side of Route 2. Since Amoco Oil was entered onto CERCLIS the road has been named Shiloh Station Road. Refer to Figure 2 for the exact location of the site.

The site can be reached by traveling south on Route 4 towards Belleville, Illinois. Take a left heading east on Route 108 for approximately five miles. Take another left on Route 43 heading north for roughly two miles. The site is located at the intersection of Route 43 and Shiloh Station Road. The legal description for the site is Section 27, Township 7 North, Range 4 East of the Third Principle Meridian, St. Clair County. A four-mile radius map of the area around the site can be found in Appendix A of this report.

The total area of the property is approximately a 1/2 acre. Site topography is nearly level without appreciable changes in elevation. A small wooded area is located in the center of the property. A small drainage ditch bisects the western portion of the site. Site run off drains directly into a residential yard located south of the site across Shiloh Station Road. Land use in the surrounding area is primarily agricultural with some residential properties. The property is bordered to the south by residences across Shiloh Station Road. A Norfolk Southern rail line forms the northern property line. County Highway 43 forms the western property line and an agricultural field is located to the east of the property.

The IEPA Office of Site Evaluation (OSE) conducted the initial site reconnaissance on August 3, 1999. The IEPA representative was accompanied by an employee from the Illinois Department of Public Health. Norfolk-Southern Railroad determined that it was not necessary to have a representative present during the site reconnaissance. During the site reconnaissance area residents were contacted in order to establish some background information on the site, and to determine places to collect residential well samples. These residences are located roughly 100 feet south of the site across Shiloh Station Road.

Little evidence remains at the site of the agricultural chemical operations which took place from 1962 until 1989. All of the aboveground storage tanks (ASTs) have been removed. Some of the concrete pads upon which the ASTs stood are still visible. All on-site buildings have been demolished as well. *The west side of the property has been covered with a layer of rock for parking.*

## **2.2 Site History**

According to available IEPA Bureau of Land file information and interviews conducted with area residents the Amoco Oil Company site was a former agriculture chemical facility. Ag-chem operations began in 1962 when the Schurock Brothers purchased the property and operated a rock phosphate business on-site. In 1965 the Schurock Brothers operation was acquired by Tuloma Gas Products which sold liquid fertilizer. In 1969 ownership of the property switched to American Oil Company/Standard Oil Division. In the early 1970's the Amoco Division of the American Oil Company operated at the property. In 1983 the facility was purchased by

Cropmate Company which was acquired by employees in 1985 and operated under the name Shiloh Valley Agricultural Service. As early as 1985 Norfolk Southern Railroad owned a portion of the property. The entire property was acquired by Norfolk Southern in 1998. Since 1998 the property has essentially sat idle. Other than the removal of AST's and covering a portion of the site with rock there have been no remedial activities conducted at the site.

### **2.3 Previous Investigations**

As indicated earlier in the report the Amoco Oil site has been the subject of previous CERCLA investigations. The first documented investigation of the site was a 1986 Preliminary Assessment conducted by the IEPA which amounted to the completion of an U.S. EPA Form 2070-12 and a recommendation that a site inspection be conducted. In 1988, a SSI was conducted by Ecology & Environment under contract by the U.S. EPA. Four shallow soil samples and four well samples were collected during the SSI. Laboratory analysis indicated that pesticide and cyanide contamination were present in on-site soil. These findings resulted in a recommendation for further CERCLA investigation.

### **2.4 Regulatory Status**

Based upon available file information the Amoco Oil site does not appear to be subject to Resource Conservation and Recovery Act (RCRA) corrective action. Given the nature of operations at the property it is unlikely that it would be subject to the Uranium Mill Tailings Radiation Control Act (UMTRCA). Given the fact that the site was primarily an agricultural chemical facility during its operational tenure, it may be subject to Federal Insecticide, Fungicide,

and Rodenticide Act (FIFRA) corrective action.

**FIGURE 1  
STATE MAP**



ILLINOIS ENVIRONMENTAL  
PROTECTION AGENCY

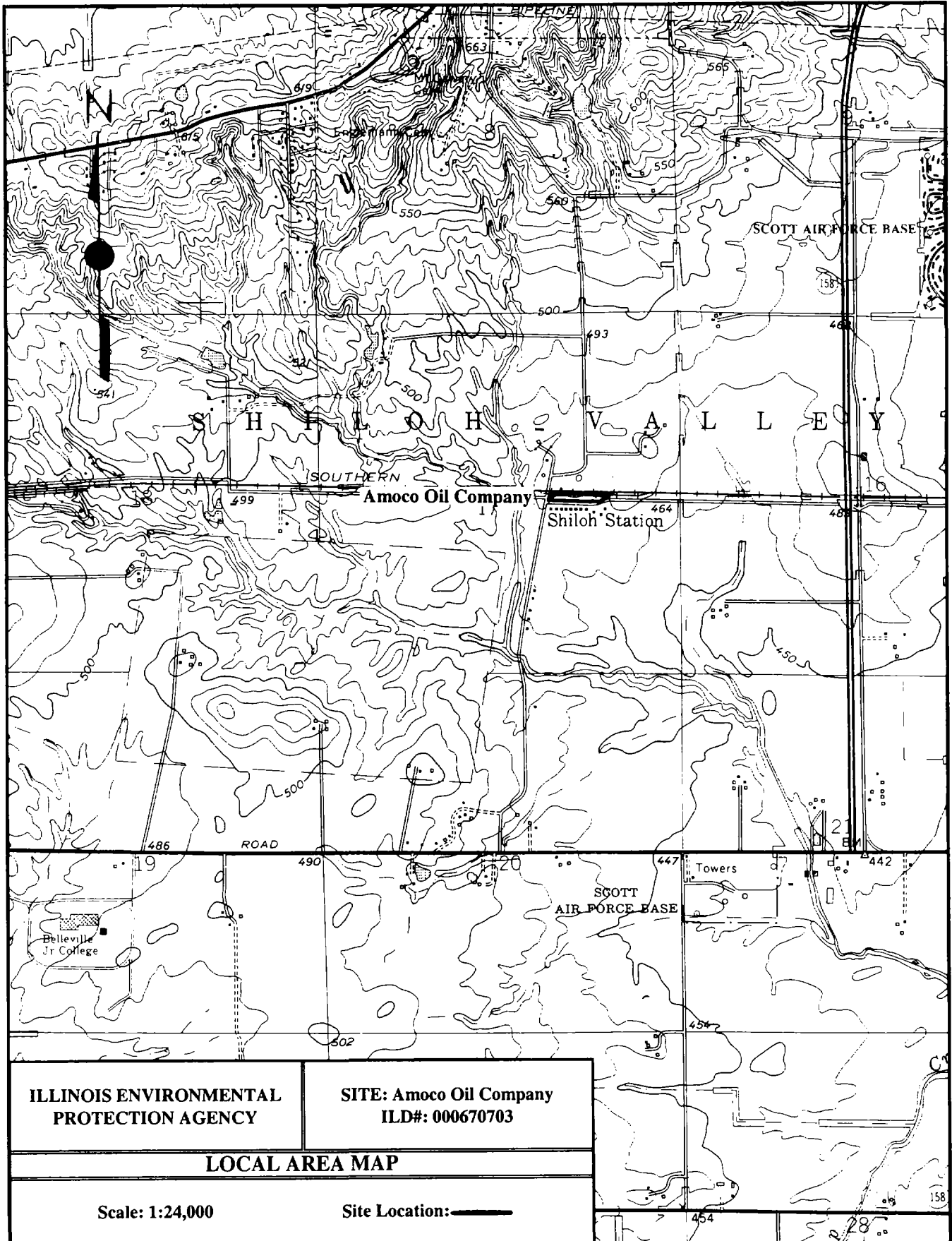
SITE: Amoco Oil Company  
ILD#: 000670703

STATE MAP

Not to Scale

Site Location: ●

**FIGURE 2**  
**LOCAL AREA MAP**



## **3.0 EXPANDED SITE INSPECTION ACTIVITIES**

### **3.1 Sampling Activities**

This section outlines procedures utilized and observations made during the 2001 ESI conducted at the Amoco Oil Company site. Specific portions of this section contain information pertaining to soil and groundwater sampling and the associated analytical results. The 2001 ESI was conducted in accordance with the site inspection work plan that was developed and submitted to U.S. EPA Region V prior to the initialization of sampling activities.

The samples were packaged and sealed in accordance with documented IEPA OSE procedures. All samples were analyzed for the Target Compound List (TCL) at Contract Laboratory Program (CLP) laboratories assigned by the U.S. EPA. Photographs of the CA field activities and a copy are provided in Appendices C and D of this report.

#### **3.1.1 Soil Sampling**

The 2001 ESI sampling event was conducted in part to determine if soil had been affected as a result of past activities at the property. The IEPA collected a total of 14 soil samples during the week of May 22, 2001. A background sample was also collected during the ESI sampling event to which site samples could be compared. All soil samples are considered part of the soil exposure pathway for HRS determination given the fact that all the samples included material collected at depths of less than two feet. The Geoprobe® was utilized to obtain some of the deeper soil samples. All soil samples were analyzed for the Target Compound List. A copy of the Target Compound List can be found in Appendix B of this report.



On-site soil samples ranged in depth from ground surface to four feet below ground surface. Refer to Table 1 for more detailed sample descriptions. Refer to Figure 3 for soil sample locations. Some shallow soil samples were collected from a drainage ditch leading from the site to a neighboring residential yard. An off-site sample was collected from the residence into which the drainage ditch flowed. All soil samples obtained using the Geoprobe® were screened using the Foxboro® Toxic Vapor Analyzer (TVA). As the Geoprobe® soil cores were extracted, the Geoprobe Macro-Core® liners were cut open, and the cores were screened at approximately one foot intervals. This screening was conducted in order to help determine from which soil horizon a sample might be collected.

### **3.1.2 Residential Well Sampling**

IEPA personnel collected four residential well samples during the 2001 ESI sampling event. All of the samples were analyzed for the Target Compound List. Residential wells were sampled in order to determine if area groundwater had been affected by site activities, and to determine if residents may be consuming contaminated water. All well samples were collected from outlets that bypassed water treatment systems. The water was allowed discharge for 15 minutes before a sample was obtained. This was done in order to purge any standing water from these systems.

All of the samples were collected from residences located immediately south of the site across Shiloh Station Road. These locations were selected prior to the sampling event and determined based upon their proximity to the site. The residents could only provide estimates regarding the

depth of their wells. Refer to Figure 3 for groundwater sample locations.

### **3.2 Analytical Results**

14 soil samples were collected during the 2001 ESI sampling event. These include both the background and duplicate sample locations. In at least one on-site soil sample the variety of contamination included volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), pesticides, and inorganic compounds. Given the laboratory data, pesticide and inorganic constituents seem to present the most consistent contamination problem at the site. It is probable that the pesticide contamination is a direct result of agricultural chemical operations at the facility.

Four residential well samples were collected during the 2001 ESI sampling event. These include the background and duplicate sample locations. A review of laboratory data regarding the residential well samples revealed that one of the residential well samples collected during the 2001 ESI sampling event revealed pesticide and inorganic contamination in groundwater at concentrations that meet the CERCLA criteria for an observed release. Once again the pesticide contamination is consistent with agricultural chemical facility operations. Please refer to the Key Sample Summaries in Tables 4 & 5 for more detailed information regarding contaminant types and concentrations for both the soil and groundwater samples.

FIGURE 3  
SAMPLE LOCATION MAP



**TABLE 1**  
**SAMPLE DESCRIPTIONS**

SAMPLE	DEPTH	APPEARANCE
X101	0" - 6"	Brown silt
X102	1' - 2'	Dark brown silt
X103	1' - 3'	Brown silty clay
X104	0" - 12"	Dark gray silty loam
X105	0' - 4'	Varied from a rocky fill and cindery silt material to a brown silty clay
X106	1' - 4'	No description available
X107	1' - 3'	Black silt with dark brown silty clay
X108	1' - 3'	Black silt with dark brown silty clay
X109	1' - 3'	Fill material with silt and clay
X110	1' - 3'	Fill material with cinders changing to a black to tan clay at 3.5'
X111 X112	0' - 4'	Material was a mixture of fill, cinders, silt, and dark gray clay
X113	0" - 6"	Dark brown to black silt with fine gravel
X114	0" - 6"	Dark brown silt with coarse gravel
G201	Unknown	Clear with no odor
G202 G203	Unknown	Clear with no odor
G204	Unknown	Clear with no odor

**TABLE 2**  
**SOIL SAMPLE SUMMARY**

SAMPLING POINT	X101	X102	X103	X104	X105	X106	X107	X108
PARAMETER	Soil (background)	Soil	Soil	Soil	Soil	Soil	Soil	Soil
<b>VOLATILES (ppb)</b>								
Chloromethane	3.0 J	5.0 J	--	--	--	--	--	3.0 J
Vinyl Chloride	11.0 UJ	--	--	--	--	2.0 J	--	--
Trichlorofluoromethane	11.0 U	--	--	--	--	--	--	1.0 J
1,1-Dichloroethene	11.0 U	--	--	79.0	--	--	--	--
Acetone	100.0 J	110.0 J	--	--	--	--	--	--
Carbon Disulfide	1.0 J	1.0 J	1.0 J	1.0 J	2.0 J	--	--	3.0 J
Methylene Chloride	11.0 U	--	3.0 J	4.0 J	4.0 J	--	4.0 J	--
2-Butanone	13.0 J	17.0 J	--	--	1.0 J	--	--	--
Benzene	11.0 U	--	--	68.0	--	--	--	--
Trichloroethene	11.0 U	--	--	54.0	--	--	--	--
Toluene	11.0 U	--	--	79.0	--	--	--	--
Chlorobenzene	15.0 U	--	--	60.0	--	--	--	--
<b>SEMIVOLATILES (ppb)</b>								
Phenol	370.0 U	--	--	2300.0	--	--	--	--
2-Chlorophenol	370.0 U	--	--	1800.0	--	--	--	--
4-Methylphenol	370.0 U	--	--	38.0 J	--	--	--	--
N-Nitroso-di-n-propylamine	370.0 U	--	--	1400.0	--	--	--	--
Naphthalene	390.0	--	35.0 J	170.0 J	66.0 J	--	600.0	--
4-Chloro-3-methylphenol	370.0 U	--	--	2900.0	--	--	--	--
2-Methylnaphthalene	1400.0	--	150.0 J	510.0	310.0 J	130.0 J	3200.0	--
2,4,5-Trichlorophenol	930.0 U	--	--	60.0 J	--	--	--	--
1,1'-Biphenyl	68.0 J	--	--	--	35.0 J	--	160.0 J	--
Acenaphthylene	370.0 U	--	80.0 J	120.0 J	51.0 J	--	--	--
Acenaphthene	370.0 U	--	--	1900.0	--	--	--	--
4-Nitrophenol	930.0 U	--	--	2800.0	--	--	--	--
Dibenzofuran	500.0	--	70.0 J	400.0	150.0 J	52.0 J	790.0	--
2,4-Dinitrotoluene	370.0 U	--	--	2000.0	--	--	--	--
Diethylphthalate	370.0 U	--	27.0 J	--	--	--	--	--
Fluorene	370.0 U	--	--	150.0 J	--	--	--	--
Pentachlorophenol	75.0 J	270.0 J	84.0 J	3400.0	85.0 J	--	--	52.0 J
Phenanthrene	1900.0	43.0 J	620.0	3400.0	760.0	270.0 J	3000.0	24.0 J
Anthracene	130.0 J	--	64.0 J	300.0 J	58.0 J	--	250.0 J	--
Carbazole	86.0 J	--	36.0 J	220.0 J	39.0 J	--	79.0 J	--
Fluoranthene	640.0	93.0 J	680.0	2700.0	350.0 J	39.0 J	440.0	--
Pyrene	690.0	82.0 J	620.0	3900.0	370.0 J	88.0 J	700.0	--
Butylbenzylphthalate	370.0 U	51.0 J	--	--	--	--	--	--
benzo(a)anthracene	290.0 J	61.0 J	310.0 J	1100.0	190.0 J	27.0 J	320.0 J	--
Chrysene	540.0	62.0 J	360.0 J	1400.0	260.0 J	33.0 J	430.0	--
bis(2-Ethylhexyl)phthalate	29.0 J	--	--	21.0 J	--	--	--	24.0 J
Benzo(b)fluoranthene	260.0 J	51.0 J	320.0 J	1100.0	240.0 J	--	330.0 J	--
Benzo(k)fluoranthene	230.0 J	57.0 J	280.0 J	950.0	180.0 J	--	310.0 J	--
Benzo(a)pyrene	210.0 J	52.0 J	300.0 J	1000.0	190.0 J	--	250.0 J	--
Indeno(1,2,3-cd)pyrene	130.0 J	29.0 J	170.0 J	490.0	140.0 J	--	81.0 J	--
Dibenz(a,h)anthracene	43.0 J	--	57.0	180.0 J	44.0 J	--	--	--
Benzo(g,h,i)perylene	140.0 J	32.0 J	170.0 J	450.0	150.0 J	--	100.0 J	--
<b>PESTICIDES (ppb)</b>								
Heptachlor	1.9 U	--	--	14.0	--	--	--	--
Heptachlor epoxide	1.9 U	--	--	13.0	--	--	--	--
Dieldrin	1.1 J	--	--	19.0	--	--	1.1 J	--
4,4'-DDE	3.7 U	--	--	7.6	--	--	--	--
4,4'-DDT	2.4 J	--	--	48.0	2.6 J	--	2.9 J	--
Endrin ketone	6.8	--	--	12.0	4.8	2.4 J	2.6 J	--
alpha-Chlordane	1.9 U	--	--	19.0	--	--	--	--
gamma-Chlordane	1.9	--	--	16.0	1.1 J	0.7 J	2.8	--
<b>INORGANICS (ppm)</b>								
Aluminum	8630.0	11800.0	10900.0	8330.0	9240.0	12200.0	11900.0	6920.0
Antimony	15.8 J	15.1 J	15.1 J	12.7 J	15.8 J	26.1 J	25.1 J	12.9 J
Arsenic	7.3	7.1	7.7	9.3	12.4	7.4	8.8	5.9
Barium	154.0	163.0	184.0	234.0	183.0	197.0	270.0	128.0
Beryllium	0.5	0.5	0.5	0.5	0.3	--	--	--
Cadmium	0.5	--	--	0.7	0.3	--	--	--
Calcium	4660.0 J	3930.0 J	2920.0 J	5640.0 J	14900.0 J	1460.0 J	2530.0 J	1100.0 J
Chromium	14.1	14.4	13.4	14.6	14.1	18.9	19.7	12.6
Cobalt	7.4	7.7	10.1	8.5	7.7	6.9	11.7	3.7
Copper	26.5	13.2	14.7	30.0	39.4	20.4	18.4	13.8
Iron	18700.0	16900.0	16800.0	19600.0	27900.0	26900.0	21700.0	29100.0
Lead	79.0	19.0	29.3	138.0	177.0	16.5	19.3	13.4
Magnesium	1940.0	2390.0	2120.0	1670.0	5480.0	2220.0	2190.0	1270.0
Manganese	556.0	706.0	1160.0	815.0	519.0	601.0	513.0	145.0
Mercury	0.1 J	0.1 J	0.2 J	0.2 J	0.1 J	0.1 J	0.1 J	0.1 J
Nickel	14.7 J	12.9 J	16.6 J	29.4 J	11.2 J	9.8 J	9.7 J	6.1 J
Potassium	1270.0	1510.0	1220.0	1610.0	870.0	1350.0	1300.0	848.0
Selenium	1.4	--	--	1.2	1.2	0.6	1.1	0.7
Silver	0.2 U	--	--	--	--	--	--	0.3
Sodium	411.0 J	419.0 J	387.0 J	611.0 J	443.0 J	402.0 J	432.0 J	443.0 J
Thallium	1.5 J	1.8 J	2.1 J	2.3 J	2.9 J	2.9 J	3.2 J	5.0
Vanadium	23.3	24.6	23.3	26.2	21.5	29.2	30.7	21.9
Zinc	119.0	177.0	59.8	172.0	105.0	84.1	66.3	36.8
Cyanide	0.5 J	0.1	0.3	0.4	--	0.3	0.3	0.4 J

**TABLE 2 (cont.)  
SOIL SAMPLE SUMMARY**

AMPLING POINT	X101	X109	X110	X111	X112	X113	X114
PARAMETER	Soil (background)	Soil	Soil	Soil	Soil (duplicate)	Soil	Soil
<b>VOLATILES (ppb)</b>							
Chloromethane	3.0 J	3.0 J	2.0 J	--	--	--	--
Vinyl Chloride	11.0 UJ	--	--	2.0 J	2.0 J	3.0 J	7.0 J
Trichlorofluoromethane	11.0 U	--	2.0 J	--	--	--	--
Acetone	100.0 J	79.0 J	--	--	--	52.0 J	110.0 J
Carbon Disulfide	1.0 J	6.0 J	3.0 J	5.0 J	2.0 J	4.0 J	4.0 J
Methylene Chloride	11.0 U	12.0 J	3.0 J	--	--	--	--
2-Butanone	13.0 J	--	--	--	--	7.0 J	12.0 J
Cyclohexane	11.0 U	--	--	--	--	--	6.0 J
Benzene	11.0 U	--	--	--	--	--	2.0 J
Methylcyclohexane	11.0 U	2.0 J	--	--	--	2.0 J	6.0 J
Toluene	11.0 U	2.0 J	2.0 J	--	--	2.0 J	3.0 J
Xylenes (total)	11.0 U	2.0 J	--	--	--	2.0 J	1.0 J
<b>SEMIVOLATILES (ppb)</b>							
4-Methylphenol	370.0 U	--	--	--	--	130.0 J	--
Naphthalene	390.0	160.0 J	940.0 J	780.0 J	420.0	660.0	380.0 J
2-Methylnaphthalene	1400.0	590.0	5600.0	3100.0	1900.0	2000.0	1300.0
1,1'-Biphenyl	68.0 J	49.0 J	210.0 J	130.0 J	76.0 J	130.0 J	59.0 J
Acenaphthylene	370.0 U	92.0 J	--	--	45.0 J	180.0 J	83.0 J
Acenaphthene	370.0 U	--	--	--	57.0 J	--	--
Dibenzofuran	500.0	250.0 J	2000.0	1000.0 J	660.0	810.0	430.0
Diethylphthalate	370.0 U	34.0 J	--	--	--	--	--
Fluorene	370.0 U	--	--	--	--	--	49.0 J
Pentachlorophenol	75.0 J	49.0 J	--	--	47.0 J	--	--
Phenanthrene	1900.0	1100.0	8400.0	4200.0	2700.0	2700.0	1800.0
Anthracene	130.0 J	97.0 J	330.0 J	240.0 J	200.0 J	290.0 J	270.0 J
Carbazole	74.0 J	52.0 J	--	91.0 J	63.0 J	110.0 J	86.0 J
Fluoranthene	640.0	540.0	830.0 J	510.0 J	330.0 J	770.0	1200.0
Pyrene	690.0	540.0	1200.0 J	870.0 J	590.0	780.0	1100.0
Benzo(a)anthracene	290.0 J	290.0 J	600.0 J	630.0 J	360.0 J	530.0	620.0
Chrysene	540.0	410.0	770.0 J	1300.0	670.0	580.0	730.0
bis(2-Ethylhexyl)phthalate	29.0 J	--	--	--	--	--	41.0 J
Benzo(b)fluoranthene	260.0 J	380.0	470.0 J	260.0 J	160.0 J	590.0	670.0
Benzo(k)fluoranthene	230.0 J	300.0 J	330.0 J	160.0 J	120.0 J	600.0	640.0
Benzo(a)pyrene	210.0 J	270.0 J	370.0 J	230.0 J	160.0 J	450.0 J	580.0
Indeno(1,2,3-cd)pyrene	130.0 J	150.0 J	140.0 J	78.0 J	51.0 J	190.0 J	250.0 J
Dibenz(a,h)anthracene	43.0 J	59.0 J	--	--	29.0 J	76.0 J	96.0 J
Benzo(g,h,i)perylene	140.0 J	150.0 J	170.0 J	80.0 J	54.0 J	220.0 J	300.0 J
<b>PESTICIDES (ppb)</b>							
Aldrin	1.9 U	--	--	11.0 J	--	--	--
Dieldrin	1.1 J	--	--	1.2 J	--	--	1.1 J
4,4'-DDD	3.7 U	--	--	2.7 J	5.7 J	--	--
4,4'-DDT	2.4 J	1.8 J	16.0 J	4.9 J	7.5 J	8.3	--
Endrin ketone	6.8	4.0	6.3 J	24.0 J	27.0 J	11.0	5.9
gamma-Chlordane	1.9	0.5 J	2.1 J	3.2 J	2.5 J	3.6	2.2
<b>INORGANICS (ppm)</b>							
Aluminum	8630.0	4940.0	645.0	2100.0	1160.0	4620.0	4500.0
Antimony	15.8 J	10.3 J	976.0 J	10.0 J	5.9 J	10.2 J	9.4 J
Arsenic	7.3	8.7	23.0	7.7	6.6	9.7	9.3
Barium	154.0	122.0	66.8	121.0	113.0	98.4	131.0
Beryllium	0.5	0.4	--	--	--	0.5	0.4
Cadmium	0.5	0.5	0.4	--	--	1.9	1.5
Calcium	4660.0 J	8770.0 J	7810.0 J	13900.0 J	23700.0 J	6440.0 J	97800.0 J
Chromium	14.1	10.2	8.8	9.9	7.5	10.5	10.1
Cobalt	7.4	6.9	2.6	2.1	1.2	10.4	12.2
Copper	26.5	33.2	3550.0 J	16.3	11.2	41.0	486.0
Iron	18700.0	22000.0	34200.0	28900.0	21200.0	18800.0	21800.0
Lead	79.0	279.0	83400.0 J	113.0	88.5	260.0	168.0
Magnesium	1940.0	2360.0	489.0	2130.0	1020.0	1600.0	3830.0
Manganese	556.0	296.0	79.6	106.0	55.6	1080.0	2600.0 J
Mercury	0.1 J	0.2 J	0.1 J	0.1 J	0.1 J	0.3 J	0.1 J
Nickel	14.7 J	13.3 J	43.8 J	5.3 J	3.6 J	33.4 J	34.1 J
Potassium	1270.0	1030.0	1770.0	999.0	767.0	524.0	739.0
Selenium	1.4	1.0	2.8	4.9	3.8	2.5	0.7
Silver	0.2 U	--	4.4	--	--	--	--
Sodium	411.0 J	506.0 J	1730.0 J	1070.0 J	878.0 J	617.0 J	571.0 J
Thallium	1.5 J	3.1 J	3.8 J	5.2	4.2 J	3.7 J	1.9 J
Vanadium	23.3	17.0	11.3	15.5	11.3	17.5	16.5
Zinc	119.0	111.0	41.8	43.1	30.2	266.0	329.0
Cyanide	0.5 J	0.4 J	0.4 J	0.3 J	0.3 J	0.6 J	0.9 J

TABLE 3  
KEY SOIL SAMPLE SUMMARY

SAMPLING POINT PARAMETER	X102	X103	X104	X105	X106	X107	X108	X109	X110	X111 (duplicate)	X112	X113	X114
<b>VOLATILES (ppb)</b>													
Benzene	--	--	68.0	--	--	--	--	--	--	--	--	--	--
Toluene	--	--	79.0	--	--	--	--	--	--	--	--	--	--
<b>SEMIVOLATILES (ppb)</b>													
2-Chlorophenol	--	--	1800.0	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	2900.0	--	--	--	--	--	--	--	--	--	--
Acenaphthene	--	--	1900.0	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	--	--	2800.0	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	--	--	3400.0	--	--	--	--	--	--	--	--	--	--
Fluoranthene	--	--	2700.0	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	950.0	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	--	--	490.0	--	--	--	--	--	--	--	--	--	--
<b>PESTICIDES (ppb)</b>													
Aldrin	--	--	--	--	--	--	--	--	--	11.0 J	--	--	--
Dieldrin	--	--	19.0	--	--	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	48.0	--	--	--	--	--	--	--	--	--	--
gamma-Chlordane	--	--	16.0	--	--	--	--	--	--	--	--	--	--
<b>INORGANICS (ppm)</b>													
Arsenic	--	--	--	--	--	--	--	--	23.0	--	--	--	--
Copper	--	--	--	--	--	--	--	--	3550.0 J	--	--	--	486.0
Selenium	--	--	--	--	--	--	--	--	--	4.9	3.8	--	--

**TABLE 4**  
**GROUNDWATER SAMPLE SUMMARY**

SAMPLING POINT		G201	G202	G203
PARAMETER		Groundwater	Groundwater	Groundwater (duplicate)
<b>PESTICIDES (ppb)</b>				
alpha-Chlordane		--	0.020 P	0.022 P
<b>INORGANICS (ppb)</b>				
Barium		81.9	55.3	54.5
Cadmium		0.5	--	0.1 M
Copper		20.8	14.3	12.6
Lead		3.8	0.7 M	0.6 M
Manganese		1.1 M	6.3	6.3
Potassium		1030.0	1950.0	2120.0
Sodium		16000.0	89000.0	8900.0
Zinc		130.0	52.2	54.4



**TABLE 5**  
**KEY GROUNDWATER SAMPLE SUMMARY**

SAMPLING POINT	G201	G202	G203
PARAMETER	Groundwater	Groundwater	Groundwater (duplicate)
<b>PESTICIDES (ppb)</b>			
alpha-Chlordane	--	0.020 P	0.022 P
gamma-Chlordane	--	0.014 P	0.018
<b>INORGANICS (ppb)</b>			
Cadmium	0.5	--	--
Iron	--	184.0	185.0
Manganese	--	6.3	6.3
Zinc	100	--	--

## **4.0 IDENTIFICATION OF SOURCES**

This section includes descriptions of the various hazardous waste sources that were identified during the 2001 Expanded Site Inspection. Section 1.1 of the revised Hazardous Ranking System (HRS) defines a “source” as: “Any area where a hazardous substance has been stored, disposed, or placed, plus those soils that have been contaminated from migration of a hazardous substance.” This does not include surface water or sediments below surface water that have become contaminated.

### **4.1 Contaminated Soil**

Based upon the laboratory results of soil samples collected during the 2001 ESI, an area of contaminated soil has been delineated at the Amoco Oil site. Based upon HRS guidance an area of contaminated soil can be determined using shallow soil samples, or those collected at a depth of less than 2 feet. Since all sample intervals began at a depth of less than 2 feet, all samples that met the HRS criteria for an observed release could have been used to delineate an area of contaminated soil. Using aerial photography and global positioning system data points the total area of contaminated soil was determined to be 37,075 square feet. The area of contaminated soil is located between sample locations X104, X109, and X114.

Specifically inorganic and pesticide contaminants appear to be the most persistent at the site. These contaminant types are generally consistent with those found at other agricultural chemical operations. In the case of the Amoco Oil Company site VOC and SVOC contamination were found at more than one sample location as well. The contamination appears to have migrated to

at least one are residence as well. Soil sample X114, which was used to delineate the are of contaminated soil, was collected from a residence located immediately south of the site. X114 was collected near the outfall of the aforementioned drainage ditch leading from the site. Site contaminants may have impacted local groundwater as well. As mentioned in Section 3.0 of this report laboratory analysis of residential well samples revealed pesticide and inorganic contaminants. Available information gives no indication that the site has a liner in place to prevent the migration of contaminants to the groundwater. Nor is there an engineered barrier/cap in place to prevent ingestion or inhalation via the soil exposure pathway.

## **5.0 MIGRATION PATHWAYS**

The Hazard Ranking System identifies three migration pathways and one exposure pathway by which hazardous substances may pose a threat to human health and/or the environment.

Consequently, sites are evaluated on their known or potential impact on these four pathways.

The pathways evaluated are groundwater migration, surface water migration, soil exposure, and air migration.

### **5.1 Groundwater**

Information concerning the subsurface geology of the area was taken from the Illinois State Geological Survey's *Groundwater Geology In South-Central Illinois, A Preliminary Geologic Report*. This report encompasses St. Clair County in which the Amoco Oil Company site is located. In the area of the site the glacial drift is thin and lack sand and gravel deposits favorable for drilled wells. Some wells have been dug to the base of this drift and are used as a water source, but the water yielding capability cannot be predicted with any reliability. Some domestic and farm supplies are located in the Pennsylvania formation which range in depth from 80 to 200 feet below ground surface. The best location for sand and gravel wells in St. Clair County occur along the Mississippi River located some 15 miles west of the site.

The Mississippian Chester sandstone has been utilized as a source of public water supply in St. Clair County. Wells have been finished in this formation at depths ranging from 50 to 500 feet. While these formations were used in the past for municipal water supplies they are generally not utilized any longer due to poor water quality. There are no public wells within the four-mile

target distance limit. The nearest public water source are a number of surface water intakes located on the Mississippi River. These intakes provide water to nearly all of Madison and St. Clair counties for those that have public water supplies. However, a number of rural residents continue to utilize private wells for potable water. Pesticides found in one of the residential well samples was also found in one of the on-site soil samples. Based upon the available analytic data it is probable that site activities has affected area groundwater. However, a more extensive groundwater investigation is likely necessary to make an absolute determination.

## **5.2 Surface Water**

There is no perennial waterway adjacent to or leading directly from the Amoco Oil site. According to U.S. Dept. of the Interior "National Wetlands Inventory" maps the nearest perennial waterway is located approximately two miles south of the site. The site is located outside of any floodplain as designated by the Federal Management Agency Flood Insurance map for St. Clair County. The surface water pathway was not further evaluated.

## **5.3 Soil Exposure**

As indicated earlier in this report a number of soil samples were collected on-site during the 2001 ESI sampling event. X114 was the only soil sample collected from a residential yard during the ESI. That sample point was chosen due to the fact that site run-off entered the yard directly via a drainage ditch leading from the site. Even though the surrounding area is sparsely populated there are at least eight residences located directly south of the site across Shiloh Station Road.

As indicated in Section 3.0 of this report a number of soil samples collected during the 2001 ESI, revealed everything from VOC, SVOC, pesticide, and inorganic contamination of on-site soil. Laboratory analysis of the soil sample collected from a neighboring residence revealed inorganic constituents that meet the HRS criteria for an observed release. All of the soil samples collected during the ESI have at least one constituent that meets the CERCLA criteria for an observed release.

There are at least eight residences located within 200 feet of the site. There are no schools or day

#### **Estimated Soil Target Populations**

On a source	2
>0 to 1/4 mile	23
>1/4 to 1/2 mile	250
>1/2 to 1 mile	400

care facilities within 200 feet of the site. There are no designated terrestrial sensitive environments located nearby. A review of U.S. Department of the Interior "National Wetlands Inventory" maps for the site revealed that are no wetland areas located on-site. There are some wetlands located within a one-mile radius of the site along some intermittent streams. The total area is impossible to determine It has been established that the site was used for recreational purposes in the past. A neighboring resident planted a garden on the former Amoco Oil property.

#### **5.4 Air Route**

Ambient air monitoring was conducted with a toxic vapor analyzer (TVA) throughout the ESI sampling event. At no time during air monitoring did the TVA give readings significantly above background concentrations. Given the fact that large on-site areas have a nearly complete lack of

vegetative cover the potential for off-site migration of airborne particulate material does exist.

As mentioned in the soil exposure pathway analysis there are at least eight residences located within 200 feet of the site. There are no schools or day care facilities within 200 feet of the site.

**Estimated Air Target Populations**

On a source	2
>0 to 1/4 mile	23
>1/4 to 1/2 mile	250
>1/2 to 1 mile	400
>1 to 2 miles	2,900
>2 to 3 miles	6,700
>3 to 4 miles	17,000

According to U.S. Department of the Interior "National Wetlands Inventory" maps there are no wetland areas located on-site. There are over 350 acres of wetlands located within a four-mile radius of the site.

## **6.0 ADDITIONAL RISKED BASED OBJECTIVES**

The residential well samples collected during the 2001 ESI sampling event of the Amoco Oil Company site were compared to Maximum Contaminant Levels (MCL's) and Removal Action Levels (RAL's) for drinking water. Only the samples that meet the HRS criteria for an observed release were compared to MCL's and RAL's. None of the contaminant concentrations in any of the residential well samples exceeded either the MCL's or RAL's.



## 7.0 REFERENCES

Bureau of the Census, County and City Data Book, 1990 U.S. Census data.

Illinois Dept. of Transportation aerial photographs, Bureau of Location and Environment, Aerial Survey Section, aerial photos from 1969, 1978, 1988, & 1998.

IEPA, Bureau of Land, file for Amoco Oil Company, St. Clair County, Illinois, L0570250003.

Illinois State Geological Survey, Groundwater Geology in South-Central Illinois, A Preliminary Geologic Report, Lidia F. Selkregg, Wayne A. Pryor, & John P. Kempton, Circular #225, 1957.

Rockford Map Publishers, 1989, Land Atlas and Plat Book for St. Clair County, Illinois.

United States Dept. of Agriculture, Soil Survey of St. Clair County, Illinois, Illinois Agricultural Experiment Station, October, 1978.

United States Dept. of the Interior, National Wetlands Inventory, 1987, Lebanon, Illinois, 7.5 Minute Topographic Map.

United States Dept. of the Interior, National Wetlands Inventory, 1987, O'Fallon, Illinois, 7.5 Minute Topographic Map.

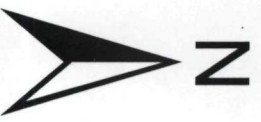
United States Dept. of the Interior, National Wetlands Inventory, 1987, Mascoutah, Illinois, 7.5 Minute Topographic Map.

United States Dept. of the Interior, National Wetlands Inventory, 1987, Venedy, Illinois, 7.5 Minute Topographic Map.

***APPENDIX A***  
***4-MILE RADIUS MAP***



Appendix A  
4-Mile Radius Map





***APPENDIX B***  
***TARGET COMPOUND LIST***

## **TARGET COMPOUND LIST**

### **Volatile Target Compounds**

Chloromethane	1,2-Dichloropropane
Bromomethane	cis-1,3-Dichloropropene
Vinyl Chloride	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropene
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroethene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
2-Butanone	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethylbenzene
Vinyl Acetate	Styrene
Bromodichloromethane	Xylenes (total)

### **Base/Neutral Target Compounds**

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl) Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis (2-Chloroisopropyl) Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene
2-Methylnaphthalene	Di-n-Butylphthalate

1,2,4-Trichlorobenzene	Fluoranthene
Isophorone	Pyrene
Naphthalene	Butylbenzylphthalate
4-Chloroaniline	bis(2-Ethylhexyl)Phthalate
bis(2-chloroethoxy)Methane	Chrysene
Hexachlorocyclopentadiene	Benzo(a)Anthracene
2-Chloronaphthalene	3-3'-Dichlorobenzidene
2-Nitroaniline	Di-n-Octyl Phthalate
Acenaphthylene	Benzo(b)Fluoranthene
3-Nitroaniline	Benzo(k)Fluoranthene
Acenaphthene	Benzo(a)Pyrene
Dibenzofuran	Ideno(1,2,3-cd)Pyrene
Dimethyl Phthalate	Dibenz(a,h)Anthracene
2,6-Dinitrotoluene	Benzo(g,h,i)Perylene
Fluorene	1,2-Dichlorobenzene
4-Nitroaniline	1,3-Dichlorobenzene
4-Chlorophenyl-phenylether	1,4-Dichlorobenzene

### Acid Target Compounds

Benzoic Acid	2,4,6-Trichlorophenol
Phenol	2,4,5-Trichlorophenol
2-Chlorophenol	4-Chloro-3-methylphenol
2-Nitrophenol	2,4-Dinitrophenol
2-Methylphenol	2-Methyl-4,6-dinitrophenol
2,4-Dimethylphenol	Pentachlorophenol
4-Methylphenol	4-Nitrophenol
2,4-Dichlorophenol	

### Pesticide/PCB Target Compounds

alpha-BHC	Endrin Ketone
beta-BHC	Endosulfan Sulfate
delta-BHC	Methoxychlor
gamma-BHC (Lindane)	alpha-Chlordane
Heptachlor	gamma-Chlordane
Aldrin	Toxaphene
Heptachlor epoxide	Aroclor-1016
Endosulfan I	Aroclor-1221
4,4'-DDE	Aroclor-1232
Dieldrin	Aroclor-1242
Endrin	Aroclor-1248
4,4'-DDD	Aroclor-1254
Endosulfan II	Aroclor-1260
4,4'-DDT	

### Inorganic Target Compounds

Aluminum	Manganese
Antimony	Mercury
Arsenic	Nickel
Barium	Potassium
Beryllium	Selenium
Cadmium	Silver
Calcium	Sodium
Chromium	Thallium
Cobalt	Vanadium
Copper	Zinc
Iron	Cyanide
Lead	Sulfide
Magnesium	

***APPENDIX C***  
***ESI SITE PHOTOGRAPHS***



**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2001

**TIME:** 1225

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 1

**DIRECTION:** North

**COMMENTS:** Photograph of on-site soil sample X102. X102 was collected from a Geoprobe location on the east side of the property. The Norfolk Southern railroad can be seen in the background.



**DATE:** May 16, 2001

**TIME:** 1255

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 2

**DIRECTION:** West

**COMMENTS:** Photograph of on-site soil sample X103. X103 was collected from a Geoprobe location on the east side of the property. The wooded portion in the center of the property is in the background.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2001

**TIME:** 1315

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 3

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X104. X104 was collected from the wooded area located in the center of the site. This location was chosen because it was reportedly gardened by one of the neighboring residents.



**DATE:** May 16, 2001

**TIME:** 1340

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 4

**DIRECTION:** North

**COMMENTS:** Photograph of on-site soil sample X105. X105 was collected from a Geoprobe location on the west side of the property. The Norfolk Southern railroad can be seen in the background.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2001

**TIME:** 1350

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 5

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X106. X106 was collected from a Geoprobe location on the west side of the property. One of the neighboring residences can be seen in the background.



**DATE:** May 16, 2001

**TIME:** 1450

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 6

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X107. The sample was collected from a Geoprobe location on the west side of the property. Neighboring residences can be seen in the background.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2001

**TIME:** 1500

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 7

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X108. The sample was collected from a Geoprobe location on the west side of the property. Neighboring residences can be seen in the background.



**DATE:** May 16, 2001

**TIME:** 1520

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 8

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X109. The sample was collected from a Geoprobe location on the west side of the property. Neighboring residences are in the photo background.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2001

**TIME:** 1530

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 9

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X110. The sample was collected from a Geoprobe location on the west side of the property.



**DATE:** May 16, 2001

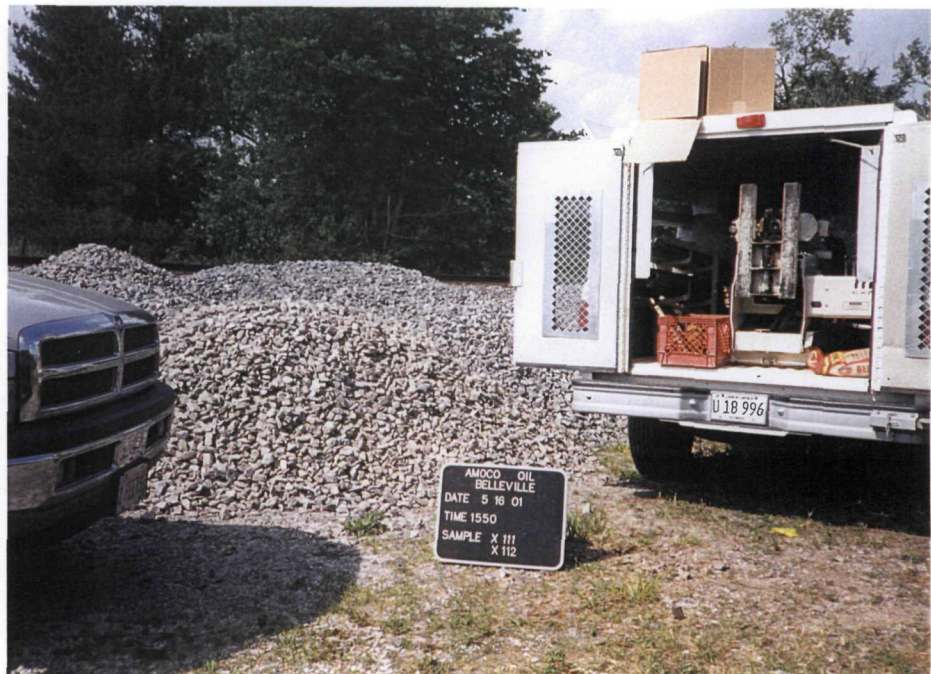
**TIME:** 1550

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 10

**DIRECTION:** South

**COMMENTS:** Photograph of duplicate on-site soil samples X111 & X112. X111 & X112 were collected from a Geoprobe location near the western entrance to the property.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 16, 2000

**TIME:** 1630

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 11

**DIRECTION:** West

**COMMENTS:** Photograph of groundwater sample G204. G204 was collected from the residence Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive



**DATE:** May 17, 2001

**TIME:** 0815

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 12

**DIRECTION:** South

**COMMENTS:** Photograph of on-site soil sample X113. A shallow sample was collected from an intermittent stream leading from the property that runs through a residential yard located just south of the site.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 17, 2001

**TIME:** 0855

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 13

**DIRECTION:** North

**COMMENTS:** Photograph of off-site soil sample X114. X114 was collected from the intermittent stream leading from the site. A portion of the site can be seen in the background.



**DATE:** May 17, 2001

**TIME:** 0910

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 14

**DIRECTION:** West

**COMMENTS:** Photograph of background soil sample X101. X101 was collected from an open field located north of the site across the Norfolk Southern railroad tracks that form the northern property boundary.





**SITE NAME:** Amoco Oil

**CERCLIS ID:** 000670703

**COUNTY:** St. Clair

**DATE:** May 17, 2001

**TIME:** 0935

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 15

**DIRECTION:** North

**COMMENTS:** Photograph of groundwater sample G201. G201 was collected from the residence at Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive



**DATE:** May 17, 2001

**TIME:** 1015

**PHOTO BY:** M. Weber

**PHOTO NUMBER:** 16

**DIRECTION:** West

**COMMENTS:** Photograph of duplicate groundwater G202 & G203. The address for the residence is not available as the owner was not home during the sampling event. The residence is located immediately south of the site across Shiloh Station Road.

